

Patent Claims

272838

1. Plastics article which inhibits water droplet formation and has a plastics substrate, at least
5 one inorganic coating (a) which inhibits water droplet formation, and an adhesion-promoting intermediate layer (b) located between the plastics substrate and the inorganic coating, characterized in that the intermediate layer
10 encompasses two polymers (A) and (B), where water forms a contact angle smaller than or equal to 73° on a layer of the polymer (A) at 20°C and water forms a contact angle greater than or equal to 75° on a layer of the polymer (B) at 20°C.
15
2. Plastics article according to Claim 1, characterized in that the plastics substrate encompasses cycloolefin copolymers, polyethylene terephthalates, polycarbonates and/or
20 poly(meth)acrylates.
3. Plastics article according to Claim 2, characterized in that the plastics substrate is composed of polymethyl methacrylate.
25
4. Plastics article according to one or more of the preceding claims, characterized in that the plastics substrate has an impact strength of at least 10 kJ/m² to ISO 179/1.
30
5. Plastics article according to one or more of the preceding claims, characterized in that the plastics substrate has a thickness in the range from 1 mm to 200 mm.
35
6. Plastics article according to one or more of the preceding claims, characterized in that the

solubility of polymer (A) in water is smaller than 1 g/l.

- 5 7. Plastics article according to one or more of the preceding claims, characterized in that the solubility of polymer (B) in water is smaller than 1 g/l.
- 10 8. Plastics article according to one or more of the preceding claims, characterized in that the thickness of the adhesion-promoting intermediate layer (b) is in the range of 0.05 and 2.0 μm .
- 15 9. Plastics article according to one or more of the preceding claims, characterized in that the proportion of polymer (A) in the adhesion-promoting intermediate layer (b) is in the range from 30 to 95% by weight, based on the weight of the adhesion-promoting intermediate layer (b).
- 20 10. Plastics article according to one or more of the preceding claims, characterized in that the proportion of polymer (B) in the adhesion-promoting intermediate layer (b) is in the range from 5 to 70% by weight, based on the weight of the adhesion-promoting intermediate layer (b).
- 25 11. Plastics article according to one or more of the preceding claims, characterized in that the polymer (A) is a vinyl polymer modified using polar groups.
- 30 12. Plastics article according to one or more of the preceding claims, characterized in that the polymer (B) is an alkyl (meth)acrylate.
- 35 13. Plastics article according to one or more of the preceding claims, characterized in that the polymer (B) are obtained by free-radical

polymerization of mixtures which comprise the following constituents

	(meth)acrylate	50 - 100% by weight
	methyl (meth)acrylate	0 - 60% by weight
5	ethyl (meth)acrylate	0 - 60% by weight
	C ₃ -C ₆ (meth)acrylate	0 - 100% by weight
	≥ C ₇ (meth)acrylate	0 - 50% by weight
	polyfunctional	
	(meth)acrylates	0 - 5% by weight
10	comonomers	0 - 50% by weight
	vinylaromatics	0 - 30% by weight
	vinyl esters	0 - 30% by weight

based on the weight of the vinyl compounds.

15 14. Plastics article according to one or more of the preceding claims, characterized in that the carbon content of the inorganic coating (a) is at most 17% by weight, based on the weight of the coating (a).

20 15. Plastics article according to one or more of the preceding claims, characterized in that the inorganic coating (a) can be obtained by curing colloidal solutions of inorganic and/or organo-metallic compounds.

30 16. Plastics article according to one or more of the preceding claims, characterized in that the inorganic coating (a) is obtainable by condensing a composition which encompasses at least 80% by weight of alkyltrialkoxysilanes and/or tetraalkoxysilanes, based on the content of condensable silanes.

35 17. Plastics article according to one or more of the preceding claims, characterized in that the inorganic coating a) encompasses condensable polysiloxanes whose molar mass is in the range from 500 to 1 500 g/mol.

18. Plastics article according to one or more of the
preceding claims, characterized in that the
thickness of the coatings (a) and (b) is in the
5 range from 0.1 to 3 μm .
19. Plastics article according to one or more of the
preceding claims, characterized in that the scrub
resistance of the plastics article to DIN 53778 is
10 at least 10 000 cycles.
20. Plastics article according to one or more of the
preceding claims, characterized in that the
plastics article has a modulus of elasticity to
15 ISO 527-2 of at least 1500 MPa.
21. Plastics article according to one or more of the
preceding claims, characterized in that the
plastics article has a weathering resistance to
20 DIN 53 387 of at least 5000 hours.
22. Plastics article according to one or more of the
preceding claims, characterized in that the
plastics article has a transparency to DIN 5033 of
25 at least 70%.
23. Process for producing plastics articles which
inhibit water droplet formation according to one
or more of Claims 1 to 23, characterized in that,
30 onto a plastics substrate,
a) an adhesion-promoting coating (b) is applied
and is cured, and encompasses two polymers (A)
and (B), where water forms a contact angle
smaller than or equal to 73° on a layer of the
polymer (A) at 20°C , and water forms a contact
35 angle greater than or equal to 75° on a layer
of the polymer (B) at 20°C , and then
b) an inorganic coating (a) which inhibits water
droplet formation is applied and cured.